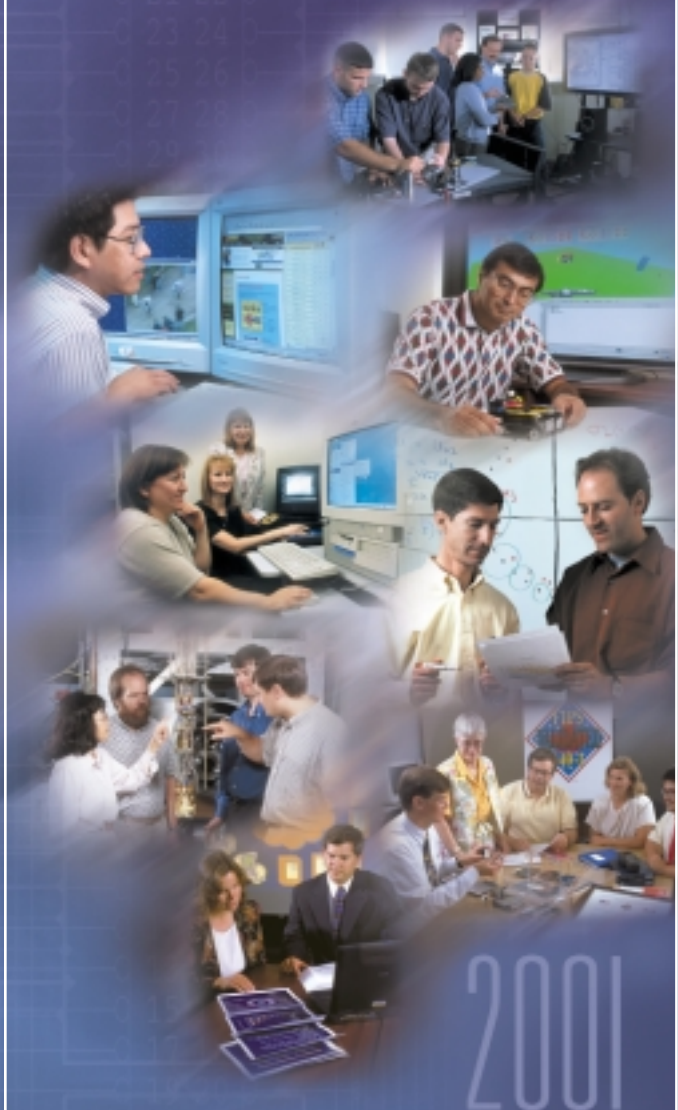
Information Technology Laboratory



2001

NIST

National Institute of Standards and Technology
Technology Administration, U.S. Department of Commerce

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About the National Institute of Standards and Technology

An agency of the U.S. Department of Commerce's Technology Administration, NIST strengthens the U.S. economy and improves the quality of life by working with industry to develop and apply technology, measurements, and standards. It carries out this mission through four interwoven programs:

- the NIST Laboratories
- the Advanced Technology Program
- the Manufacturing Extension Partnership
- the Baldrige National Quality Program

For more information about NIST, see http://www.nist.gov.

January 2001

U.S. DEPARTMENT OF COMMERCE
Donald L. Evans, Secretary

Technology Administration
Karen H. Brown, Acting Under Secretary
of Commerce for Technology

National Institute of
Standards and Technology
Karen H. Brown, Acting Director

We welcome you, our customers and clients, to the Information Technology Laboratory (ITL) of the National Institute of Standards and Technology (NIST) of the Commerce Department's Technology Administration. ITL's mission is to strengthen the U.S. economy and improve the quality of life by developing and applying technology, measurements, and standards for information technology (IT). Working in partnership with industry, academia, government, and consortia, we develop tests and test methods, quality assurance techniques, tools, models, reference data, and proof-of-concept implementations for emerging and forward-looking information technologies.

ITL*'s current research and development projects within eight technical divisions are listed in this brochure. Each project is linked to a relevant Web page or technical contact. An alphabetical cross-reference of ITL projects, products, and resources follows the division listings. We offer many opportunities for collaboration with industry organizations in these and other areas of mutual interest. Our management team is available for consultation on IT issues, solutions, and research directions.*

T*o learn more about the challenging and exciting work of our laboratory, we invite you to view our Web site at http://www.itl.nist.gov. In partnership with industry, ITL will continue to produce the tools and metrics needed by U.S. industry in the new millennium to develop high-quality IT products and services for the global marketplace. We look forward to hearing from you, our customers, and sharing our resources and experience.*

William O. Mehuron, Director
Susan F. Zevin, Deputy Director
Information Technology Laboratory
E-mail: itlab@nist.gov

The Mathematical and Computational Sciences Division

The Mathematical and Computational Sciences Division provides technical leadership within NIST in modern analytical and computational methods for solving scientific problems of interest to U.S. industry. Ronald F. Boisvert, Chief, (301) 975-3800, *ronald.boisvert@nist.gov*

Mathematical Modeling Group
Geoffrey McFadden, Group Leader
(301) 975-2711, *geoffrey.mcfadden@nist.gov*

Measurement Science for Optical Reflectance and Scattering
http://ciks.cbt.nist.gov/appearance/

Micromagnetic Modeling
http://math.nist.gov/oommf/

OOF: Object Oriented Finite Element Software for Materials Science
http://www.ctcms.nist.gov/oof/

Time-Domain Algorithms for Computational Electromagnetics (AlgoCEM)
http://www.boulder.nist.gov/itl/div891/alpert/td-em/index.html

Mathematical Software Group
Roldan Pozo, Group Leader
(301) 975-4317, *roldan.pozo@nist.gov*

Digital Library of Mathematical Functions (DLMF)
http://dlmf.nist.gov/

Fortran 90 Bindings for OpenGL®
http://math.nist.gov/f90gl/

Guide to Available Mathematical Software (GAMS)
http://gams.nist.gov/

Java™ Numerics
http://math.nist.gov/javanumerics/

NIST Sparse BLAS
http://math.nist.gov/spblas/

Optimization and Computational Geometry Group
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Combinatorial Problems and Monte Carlo Methods
isabel.beichl@nist.gov

Surface Approximation
christoph.witzgall@nist.gov

Scientific Applications and Visualization Group
Judith Devaney, Group Leader
(301) 975-2882, *judith.devaney@nist.gov*

Interoperable Message Passing Interface (IMPI) and Conformance Tester
http://impi.nist.gov/IMPI/

Parallel Computing Consulting
john.hagedorn@nist.gov

Visualization Consulting
steven.satterfield@nist.gov

The Advanced Network Technologies Division

The Advanced Network Technologies Division strives to provide the networking industry with the best in test and measurement technology. Kevin L. Mills, Chief, (301) 975-3643, *kevin.mills@nist.gov*

Networking for Pervasive Computing
kevin.mills@nist.gov

High Speed Network Technologies Group
David H. Su, Group Leader
(301) 975-6194, *david.su@nist.gov*

Wave-Division Multiplexing Modeling, Control, and Management
Agile Switching Infrastructure
http://w3.antd.nist.gov/Projects/projects_antd.html#HighSpeed

Wireless Communication Technologies Group
Nader Moayeri, Group Leader
(301) 975-3767, *nader.moayeri@nist.gov*

Characterization of Broadband Wireless Communication Systems
Future Generation Wireless Communication Systems
Mobile Ad Hoc Networks
http://w3.antd.nist.gov/wctg/index.html

Internetworking Technologies Group
Douglas Montgomery, Group Leader
(301) 975-3630, *dougm@nist.gov*

Internet Infrastructure Protection
IP Telephony
Active Networks Measurement
http://www.antd.nist.gov/itg

The Computer Security Division

The Computer Security Division enables organizations and individuals to use information technology with the assurance and trust that the confidentiality, integrity, reliability and availability of information resources are protected. Edward A. Roback, Chief, (301) 975-3696, *edward.roback@nist.gov*

Security Technology Group
William Burr, Group Leader
(301) 975-2914, *william.burr@nist.gov*

Advanced Encryption Standard (AES)
http://aes.nist.gov/

Cryptographic Module Validation Program (CMVP)
http://csrc.nist.gov/cryptval/

Cryptographic Toolkit Standards
elaine.barker@nist.gov

Encryption Key Recovery
http://csrc.nist.gov/tacdfipsfkmi/

Public Key Infrastructure (PKI)
http://csrc.nist.gov/pki/

Random Number Generation and Testing (RNG)
http://www.itl.nist.gov/div893/projects/893-99-RNG.htm

S/MIME and Key Recovery Demonstration Project
http://csrc.nist.gov/krdp/

Systems and Network Security Group
Tim Grance, Group Leader
(301) 975-4242, *grance@nist.gov*

Authorization Management and Access Control Models
http://hissa.nist.gov/rbac

Computer Security Guidance
Computer Security Resource Center (CSRC)
http://csrc.nist.gov

ICAT Metabase
http://csrc.nist.gov/icat

IT Security Training and Awareness Resource Center
http://patapsco.nist.gov/itl/div893/gits/main.html

Mobile Agent Intrusion Detection and Security Research
http://csrc.nist.gov/mobileagents/index.html

National Information Assurance Partnership (NIAP)
http://niap.nist.gov/

The Information Access Division

The Information Access Division accelerates the development of technologies that allow intuitive, efficient access, manipulation, and exchange of complex information by facilitating the creation of measurement methods and standards. Martin Herman, Chief, (301) 975-4495, *martin.herman@nist.gov*

NIST Smart Space Testbed
http://www.nist.gov/smartspace/

Speech Group
David S. Pallett, Group Leader
(301) 975-2935, *david.pallett@nist.gov*

Spoken Language Technologies Benchmark Tests, Corpora, and Software Tools
http://www.itl.nist.gov/iad/894.01/tools/index.htm

Retrieval Group
Donna K. Harman, Group Leader
(301) 975-3569, *donna.harman@nist.gov*

Digital Video Test Collection
http://www.itl.nist.gov/iad/894.02/projects/dv/

Text REtrieval Conference (TREC)
http://trec.nist.gov

Image Group
Charles L. Wilson, Group Leader
(301) 975-2080, *charles.wilson@nist.gov*

Fingerprint/Law Enforcement Standards
Human ID
http://www.nist.gov/itl/div894/894.03/

Visualization and Usability Group
Sharon J. Laskowski, Group Leader
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Usability Engineering and WebMetrics
Visualization and Virtual Reality for Manufacturing
http://www.itl.nist.gov/div894/vvrg/

The Convergent Information Systems Division

The Convergent Information Systems Division facilitates high-impact industry cooperation through research and development into state-of-the-art convergent information systems via advanced systems and application integration by: 1) creating and prototyping systems for the display, storage, and access of all forms of digital content; 2) serving as a neutral testbed for measurements and standards that provide verifications of functionality for multimedia technologies, and gaining experience in the deployment of these technologies and developing metrics for these representative technologies; 3) evaluating advanced hardware and software components, new architectures, novel application technologies, and innovative measurement and test methods. Victor R. McCrary, Chief, (301) 975-4321, *victor.mccrary@nist.gov*

Distributed Systems Technologies Group
Gordon E. Lyon, Group Leader
(301) 975-5679, *gordon.lyon@nist.gov*

Digital TV Application Software Environment (DASE)
http://www.nist.gov/itl/div895/cmr/dase/index.html

Internet Time Synchronization
http://www.nist.gov/itl/div895/cmr/multikron/index.html

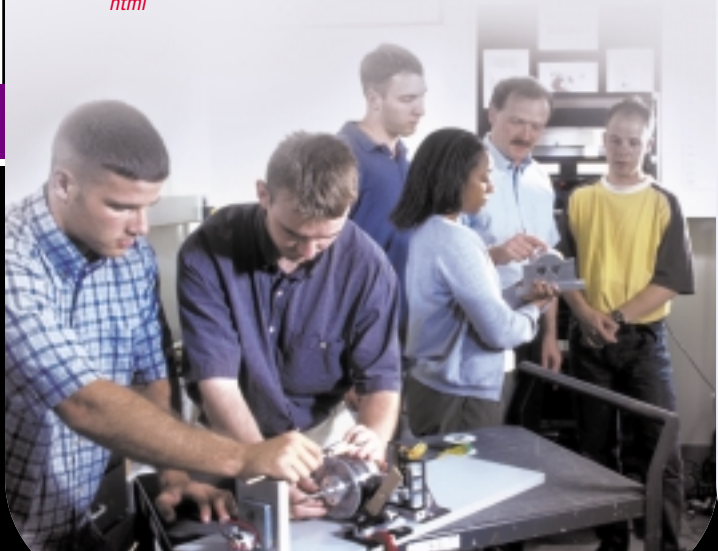
Micro- E-Commerce
http://www.nist.gov/itl/div895/cmr/ecom/index.html

Information Storage and Integrated Systems Group
Xiao Tang, Acting Group Leader
(301) 975-2503, xiao.tang@nist.gov

Electronic Book/Braille Reader
http://www.nist.gov/itl/div895/isis/projects/ebookproject.html

Biometrics and Smart Cards
http://www.nist.gov/itl/div895/isis/projects/biometricsproject.html

DVD and Data Storage
http://www.nist.gov/itl/div895/isis/projects/datastorageproject.html



The Information Services and Computing Division

The Information Services and Computing Division provides the IT resources, supporting infrastructure, applied research, and assistance to NIST staff, collaborators, and clients for scientific, engineering, and administrative applications. Raymond Hoffmann, Chief, (301) 975-3738, *raymond.hoffmann@nist.gov*

Centralized Helpdesk
IT Support Benchmarking / Baldrige Evaluation
Managed Desktop

Enterprise Systems Administration Group
Robert J. Crosson, Group Leader
(301) 975-3832, *robert.crosson@nist.gov*

Computer Security Initiative
Enterprise E-mail Centralization
Unix Server/Workstation Support

Thin Client
Windows NT Support Initiative
matthew.wilkinson@nist.gov

Web and Internet Technology Services Group
James R. Graham, Group Leader
(301) 975-2977, *james.graham@nist.gov*

Electronic Approval
ITL Web Support
Webcasting
Web/Internet Services

Administrative Computing Support Group
Robert Lee, Group Leader
(301) 975-4061, *bob.lee@nist.gov*

Administrative Applications Development
Commerce Administrative Management System (CAMS)
Commerce Standard Acquisition Reporting System (CSTARS)
Grants Management Information System
Non-Employee Information System
Performance Payout System

PC Support Group
Ronald B. Wilson, Group Leader
(301) 975-3352, *ronald.wilson@nist.gov*

PC Support
Travel Manager

High Performance Systems Group
Jack L. Newmeyer, Group Leader
(301) 975-2966, *jack.newmeyer@nist.gov*

Network and Telecommunications Systems Group
John K. Antonishek, Group Leader
(301) 975-5895, *john.antonishek@nist.gov*

Backbone Operation and Migration
NISTnet
Remote User Support
david.kim@nist.gov, michael.ting@nist.gov

The Software Diagnostics and Conformance Testing Division

The Software Diagnostics and Conformance Testing Division develops software testing tools and methods that improve quality, conformance to standards, and correctness. Mark W. Skall, Chief, (301) 975-3262, *mark.skall@nist.gov*

Software Quality Group
John Barkley, Group Leader
(301) 975-3346, *john.barkley@nist.gov*

Automatic Generation of Tests from Formal Specifications
http://hissa.nist.gov/~black/FTG/autotest.html

Error, Fault, and Failure Data Collection and Analysis
http://hissa.nist.gov/

Healthcare Information Systems
http://www.nist.gov/va/

Interactive TV
http://www.dase.nist.gov

Quantum Information
paul.black@nist.gov

Unravel
http://www.nist.gov/itl/div897/sqg/unravel/unravel.html

Standards and Conformance Testing Group
Lynne Rosenthal, Group Leader
(301) 975-3283, *lsr@nist.gov*

Architectural Description Languages for Component-Based Software Development
Integrated ISO GIS Standards for Industry
christopher.dabrowski@nist.gov

Aroma Pervasive Computing Project
http://www.nist.gov/aroma

Java™ Testing Project
http://www.nist.gov/java_ca.htm

Learning Technologies
http://www.itl.nist.gov/div897/ctg/graphics/learn/learntech.htm

Software Testing by Statistical Methods
http://www.nist.gov/stsm.html

Technology Transfer of Conformance Testing Programs
http://www.nist.gov/ctdirectory.html

VRML and X3D Conformance Testing
http://www.nist.gov/vrml.html

XML/DOM Conformance Testing
XSL Conformance Testing
XML Schema
http://www.itl.nist.gov/div897/ctg/xml/

XML Registry and Repository Interfaces
http://www.nist.gov/itl/div897/ctg/regrep/index.html

Interoperability Group
Barbara Guttman, Group Leader
(301) 975-4207, *barbara.guttman@nist.gov*

Requirements Collection for Forward-Looking Standards
barbara.guttman@nist.gov

Metadata Descriptions and Registries
judith.newton@nist.gov

National Software Reference Library (NSRL) and Computer Forensics Tools Verification
http://www.nsrl.nist.gov

The Statistical Engineering Division

The Statistical Engineering Division advances measurement science and technology by collaborating on NIST multidisciplinary research and by formulating, developing, and applying statistical methodology for the collection and analysis of data critical to NIST scientists and engineers. Nell Sedransk, Chief
(301) 975-2839, *nell.sedransk@nist.gov*

Metrology and Statistical Computation Group
Nien-Fan Zhang, Group Leader
(301) 975-2842, *nien-fan.zhang@nist.gov*

NIST/SEMATECH
http://www.itl.nist.gov/div898

Key Comparisons for International Equivalence Agreements
nien-fan.zhang@nist.gov

Bayesian Metrology
nell.sedransk@nist.gov

Statistical Computing
alan.heckert@nist.gov

Statistical Modeling and Analysis Group
James F. Filliben, Group Leader
(301) 975-2855, *james.filliben@nist.gov*

Design and Analysis of Multi-Laboratory Studies
james.filliben@nist.gov

Certification of Reference Materials
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Stochastic Modeling for Physical Processes
andrew.rukhin@nist.gov

Statistical Training in Metrology
james.filliben@nist.gov

Boulder Statistics Group
Dominic Vecchia, Group Leader
(303) 497-3807, *dfv@nist.gov*

Characterization of Optoelectronic Materials and Devices
jack.wang@nist.gov

Spatial Statistics and Computer Intensive Methodology
kevin.coakley@nist.gov

Device Calibration
jolene.splett@nist.gov

ITL Projects, Products, and Resources

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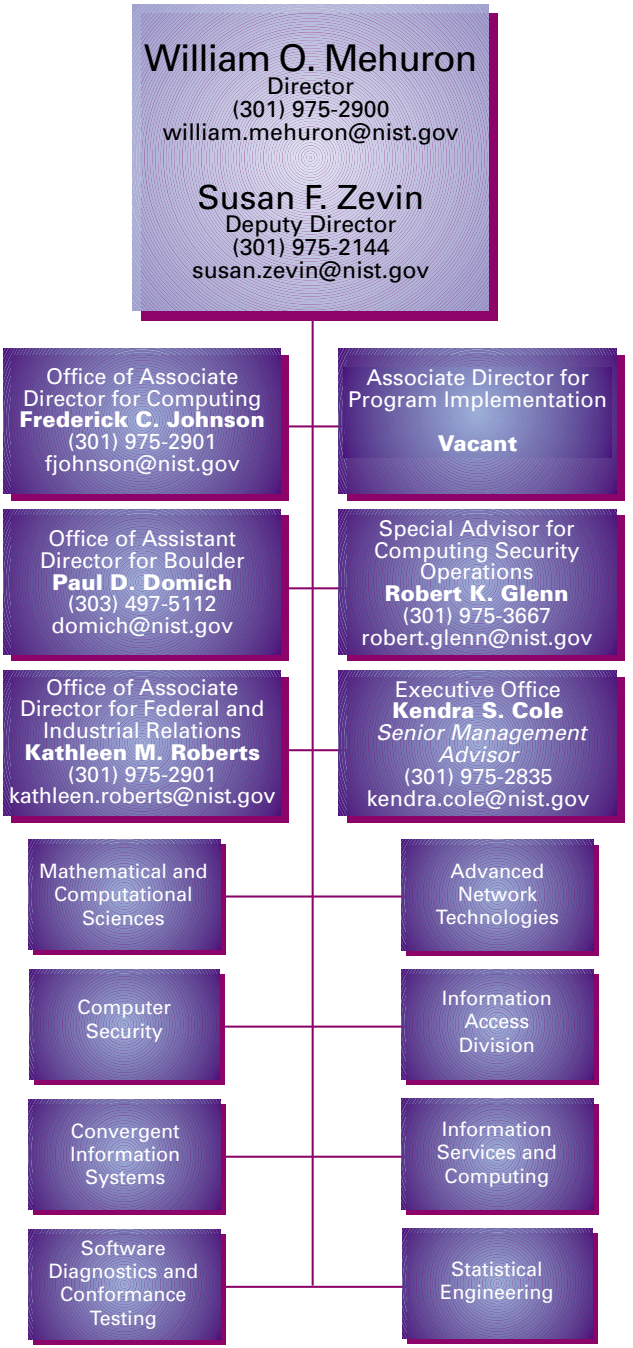

NOTE: Reference to specific commercial products or brands is for information purposes only; no endorsement or recommendation by the National Institute of Standards and Technology, explicit or implicit, is intended or implied.

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